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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,321	05/14/2001	Tuomo Suntola	ASMMC.013C2	9994

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EXAMINER

FULLER, ERIC B

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/855,321

Applicant(s)

SUNTOLA ET AL.

Examiner

Eric B Fuller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION***Specification***

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claims 18, 19, 34, 35, and 43, read to evacuate the chamber a number of times during each interval between reactant feeds. However, the specification only gives support for evacuating the chamber with a volume of purge gas that is 2-10 times larger than the volume of the chamber (page 8, first paragraph). The claims seem to claim 2-10 individual purging steps during each interval, while the specification seems to be drawn to a continuous purge that uses a volume of purge gas that is 2-10 times larger than the volume of the chamber. Thus the specification fails to support the limitations of these claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 30-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 30 and 31, "the apparatus" lacks antecedent basis. Accordingly, because the preambles read "the apparatus of claim..." and the claims from which they

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depend are method claims, these claims are confusing as the statutory class of the invention is unclear. For examination purposes, it is assumed that these are method claims.

In claim 32, "at least essentially laminar flow" is confusing. It is unclear what the "at least" entails. Does this include turbulent flow since turbulent flows are "at least" laminar in terms of Reynolds Number?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

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Claims 17, 20-22, 24, and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakuma et al. (US 5,270,247).

Sakuma teaches an ALE method that uses purging in between cycles to evacuate the process chamber (column 3, lines 3-40). The evacuation is made as complete as possible (column 5, lines 30-35), which reads on the applicant's claims 20 and 21. Separate inflow paths feed the reactants (column 6, lines 15-20). The reactant is mixed with the inactive (purge) gas prior to entering the chamber (column 6, lines 39-62).

Claims 17-19, 22, 24, 25, and 32-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Yokoyama et al. (US 5,483,919).

Yokoyama teaches an ALE process that uses a purge gas to evacuate the process chamber. The reactant is fed to fill the chamber and the purging step lasts three times longer (column 4, lines 5-10). Separate inflow paths feed the reactants (figure 1). The reactant is mixed with an inactive (carrier) gas prior to entering the chamber (column 4, lines 40-50).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 26-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma et al. (US 5,270,247) or Yokoyama et al. (US 5,483,919), as applied to claim 17 above, and further in view of Moore, Sr. (US 3,662,583).

Sakuma and Yokoyama, both, independently teach the limitations to claim 17. Both references are silent to the use of oblong feed pipes. However, Moore teaches that using oblong feed types for feed a process space provides a wider spread of feed gas, such that the process space may be reduced. One of skill in the art would recognize that a smaller process space would result in less feed gas and process/evacuation times required. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize oblong feed pipes in the processes of either Sakuma or Yokoyama. By doing so, the volume of the process chamber may be reduced, resulting in less feed gas required and smaller process/evacuation times.

Claims 18, 19, 23, and 33-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma et al. (US 5,270,247).

As to claims 18, 19, and 33-35, Sakuma teaches the limitations of claim 17, but is silent to the degree of evacuation. . However, it is taught that the purging should be long enough such that the evacuation is as complete as possible without removing any reactants from the substrate surface (column 5, lines 30-60). To determine this amount would have been within the skill of one practicing in the art, through routine

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experimentation. As to claim 23, to determine the capacity of the pump would have also been within the skill of one practicing in the art to achieve this desired amount of evacuation.

As to claims 36-40, it has been discussed above how it would have been obvious to one of ordinary skill to minimize the volume of the process chamber such that less feed gas is required and smaller process/evacuation times are realized. Therefore, to determine what these dimensions are, while still performing the process with success, would have been within the skill of one practicing in the art, through routine experimentation.

As to claims 41-43, the reference fails to explicitly teach purging the second feed line while the first reactant is flowed through the first feed line, and vice-versa. However, the reference does teach that the purge is used to prevent the two feed gases from ever coming into contact with each other. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to purge the feed lines that are not feeding reactants, when other feed lines are being utilized. By doing so, contamination of the reactant source with the other reactants is prevented.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 17-29 and 32-35 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 6,015,059. Although the conflicting claims are not identical, they are not patentably distinct from each other because all the limitations of the present invention are claimed in the U.S. Patent. However, the independent claim is slightly broader in scope as the present invention omits the limitations of degree of evacuation and feeding a purge gas during evacuation. However, to omit these limitations, and use them as dependent claims, would have been obvious at the time the invention was made to a person having ordinary skill in the art with a reasonable expectation of similar results. As the dependent claims of the present invention do not present these same limitations in the same combination as the independent claim of the U.S. Patent, statutory double patenting had been avoided. However, obvious-type double patenting still exists.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Mondays through Thursdays.

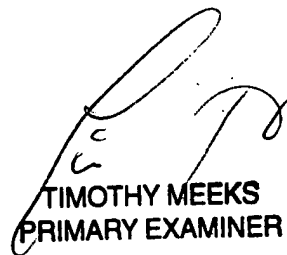
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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached at (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



EBF
August 18, 2003



TIMOTHY MEEKS
PRIMARY EXAMINER